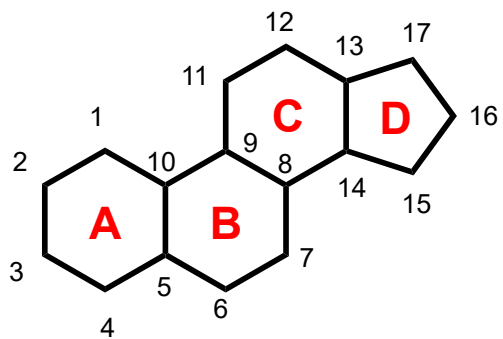


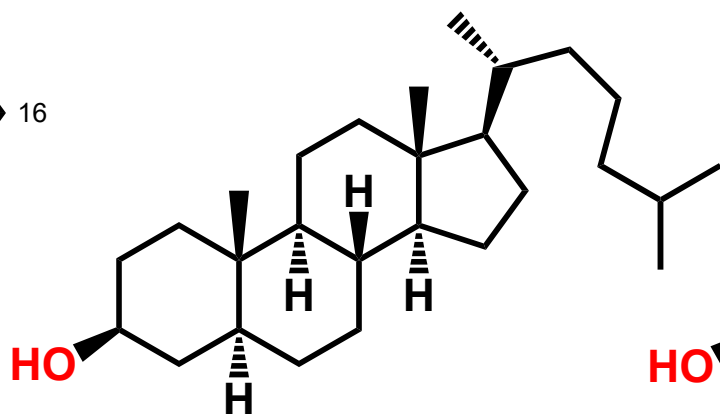


Krishna P Kaliappan
Professor of Chemistry, IIT Bombay

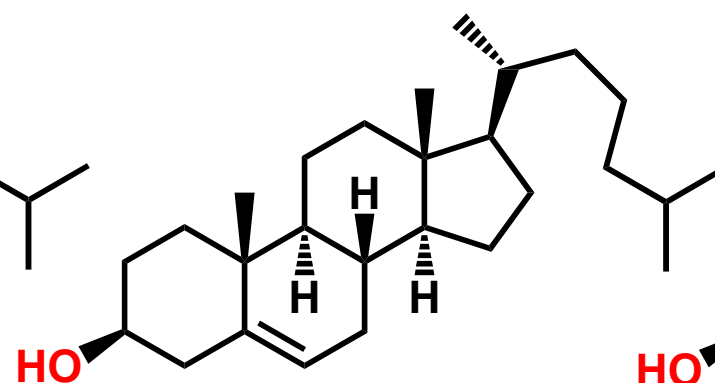
CH-845 Course on Organic Synthesis



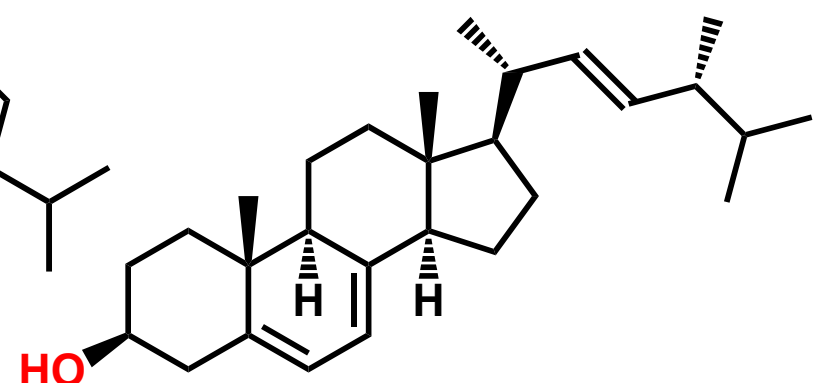
Numbering of
Steroid skeleton



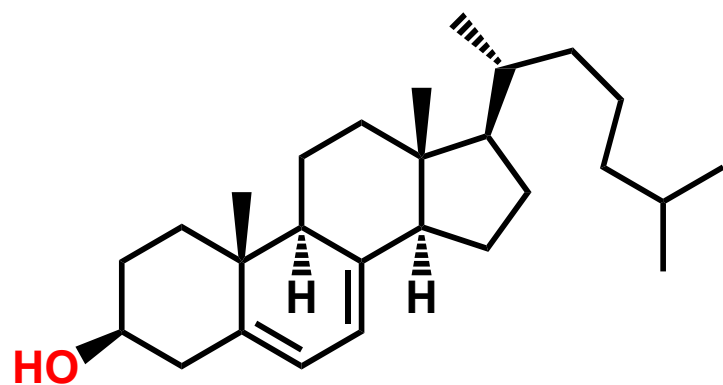
Cholestanol



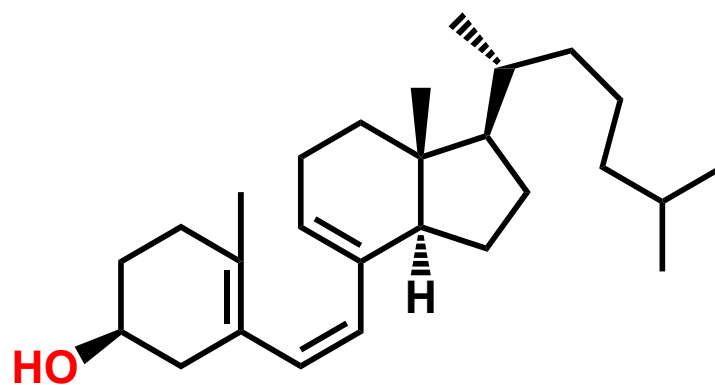
Cholesterol



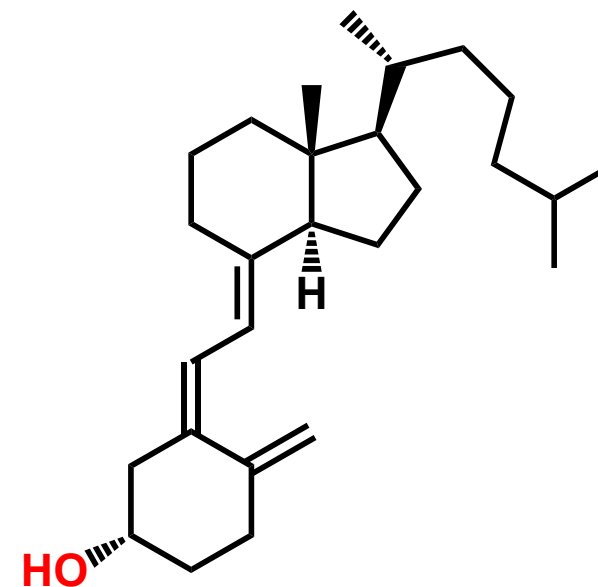
Ergosterol



Dehydrocholesterol

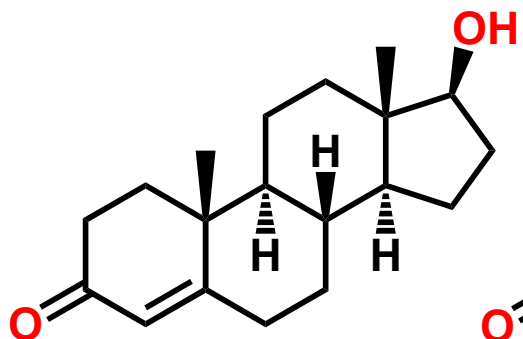


Previtamin D₃

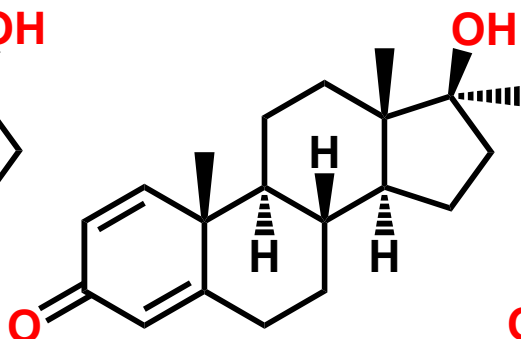


Vitamin D₃

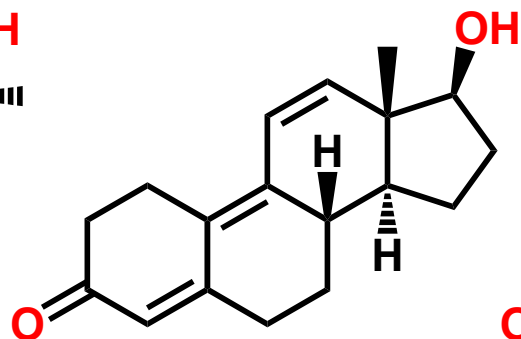
Male Sex Hormones



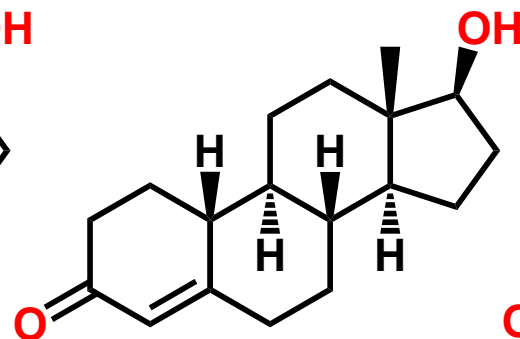
Testosterone



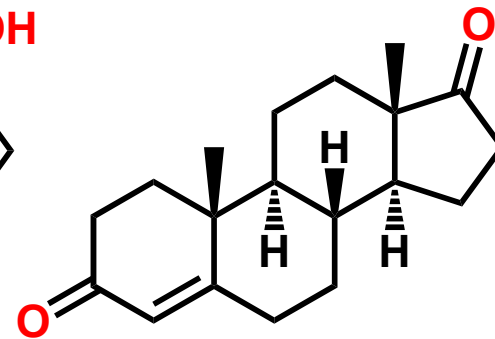
Dianabol



Trenbolone

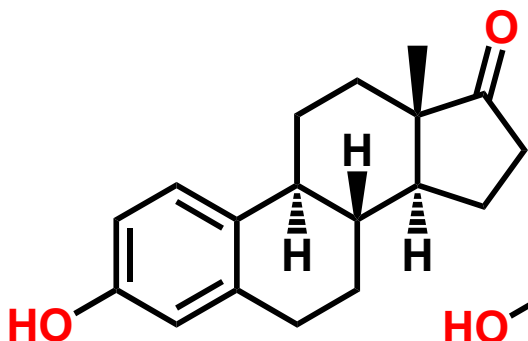


Nandrolone

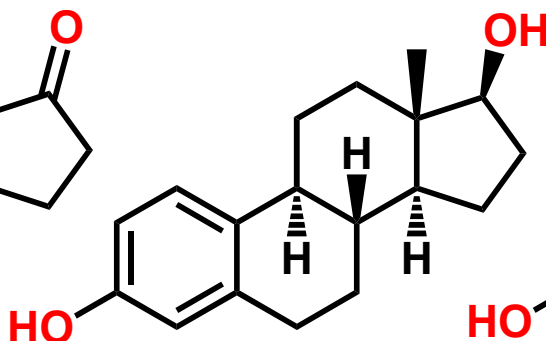


Androstendione

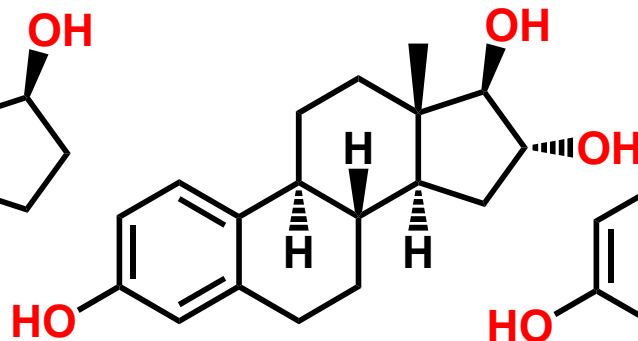
Female Sex Hormones



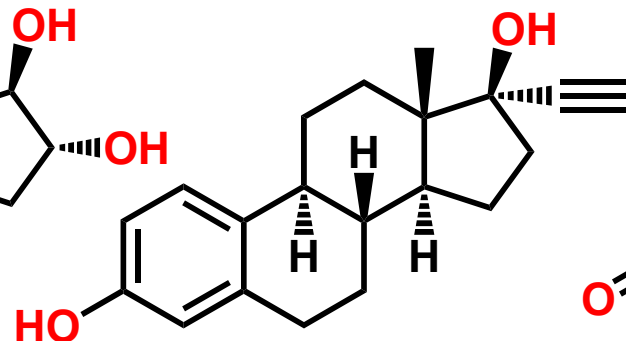
Estrone



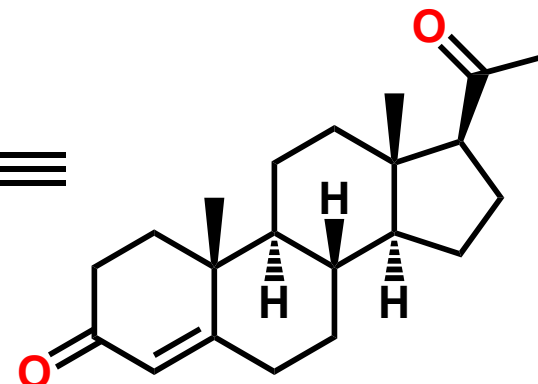
Estradiol



Estriol



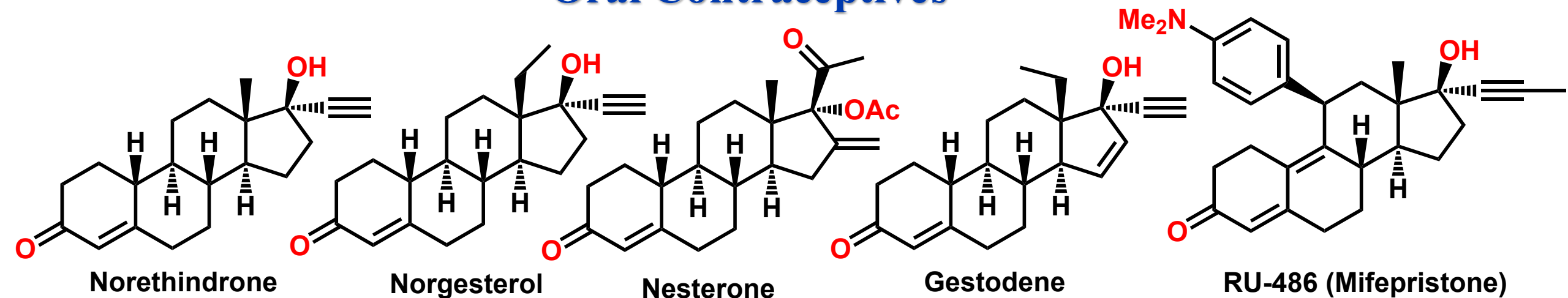
Ethynyl estradiol



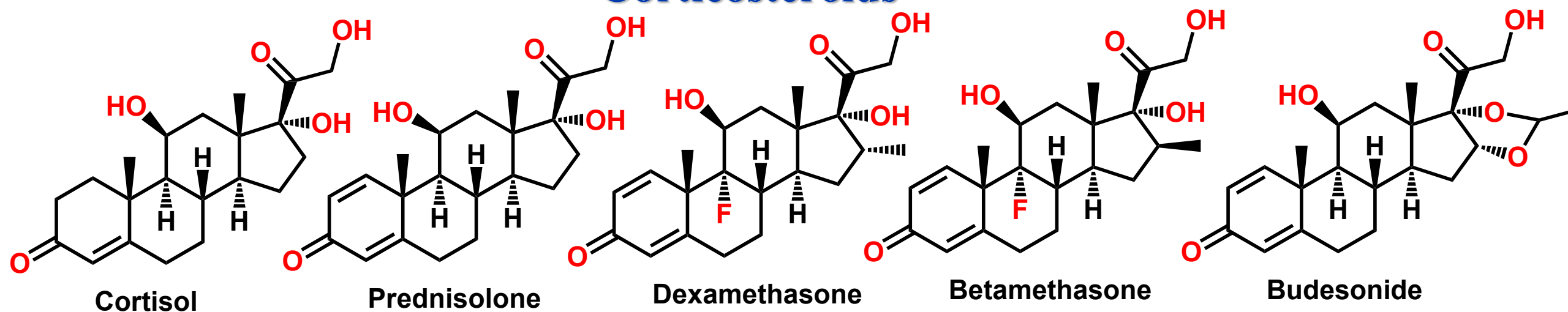
Progesterone

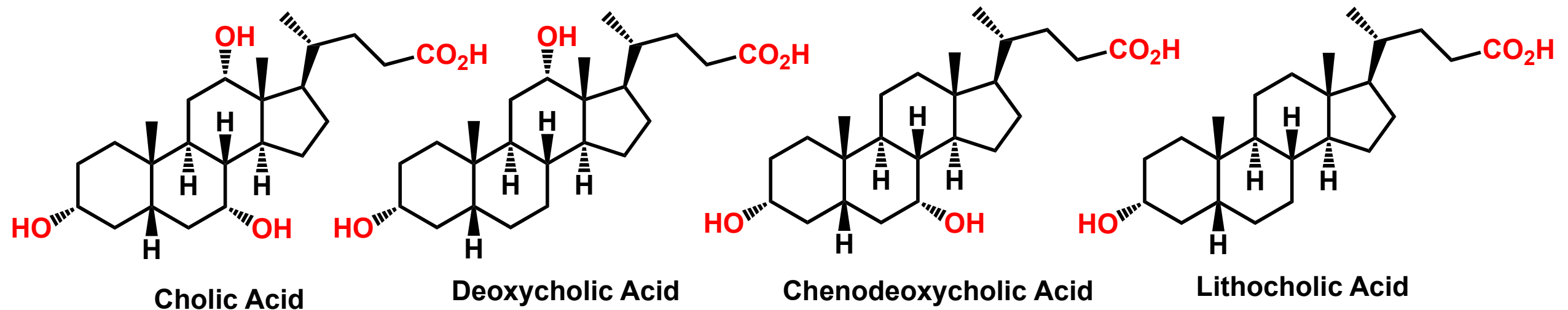
Other Steroids

Oral Contraceptives



Corticosteroids



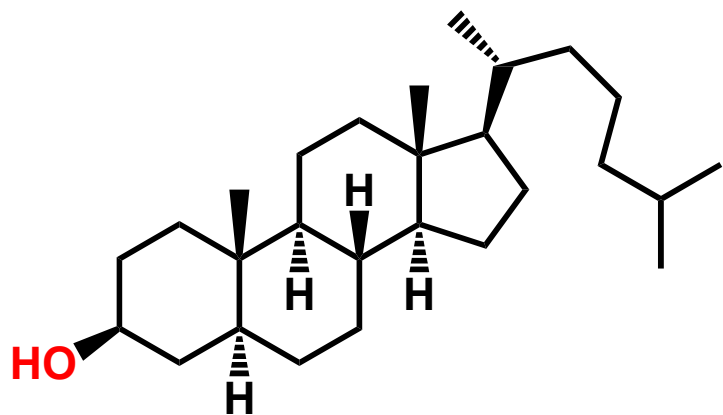


Steroid skeleton consists of **three fused cyclohexane rings** and **one cyclopentane ring**

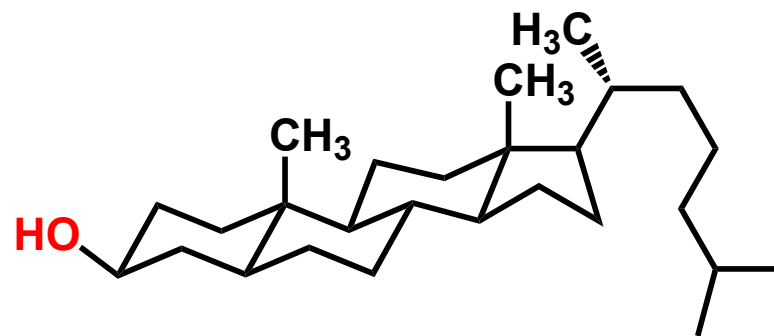
In most cases, there are **two angular methyl groups** at **C-10** and **C-13**

Substituents on the same side as these **two angular methyl groups** are β -substituents

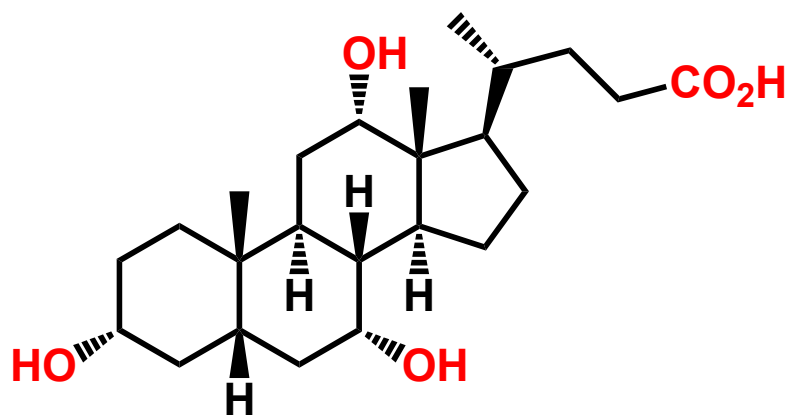
Trans-anti (cis-anti), **trans-anti** & **trans-anti** ring junctions



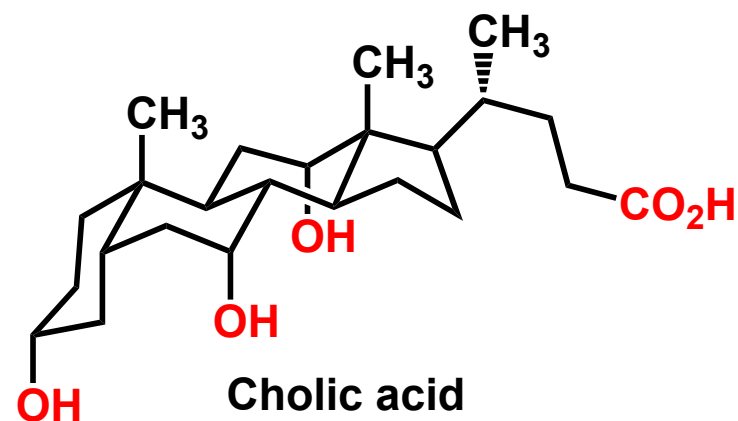
Cholesterol



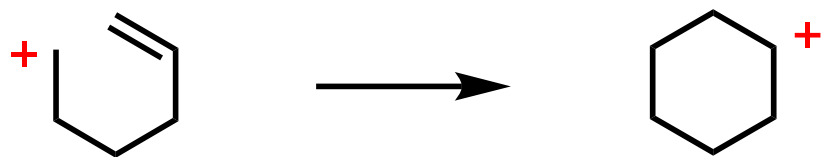
Cholesterol



Cholic Acid



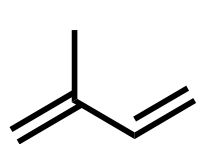
Cholic acid



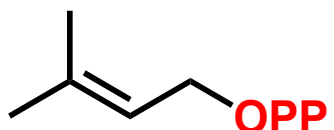
Terpene Biosynthesis

monoterpenes	C10	geraniol
sesquiterpenes	C15	farnesol
diterpenes	C20	geranylgeraniol
steroids	C30	squalene

Isoprene-basic building block

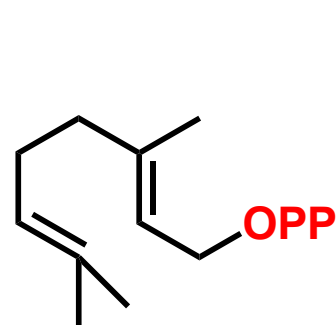
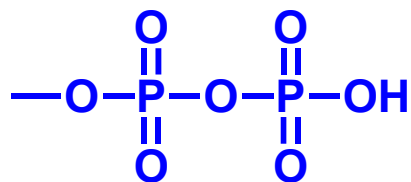


isoprene unit

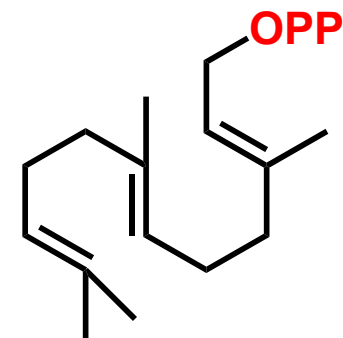


isopentenyl-PP

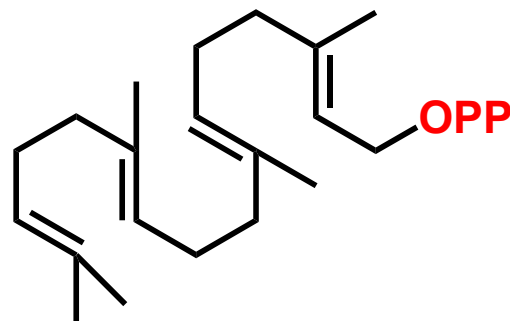
PP = pyrophosphate



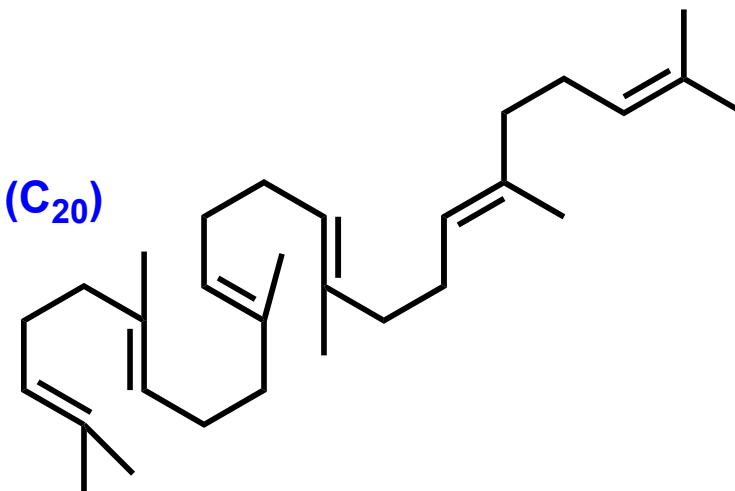
geraniol-PP (C₁₀)



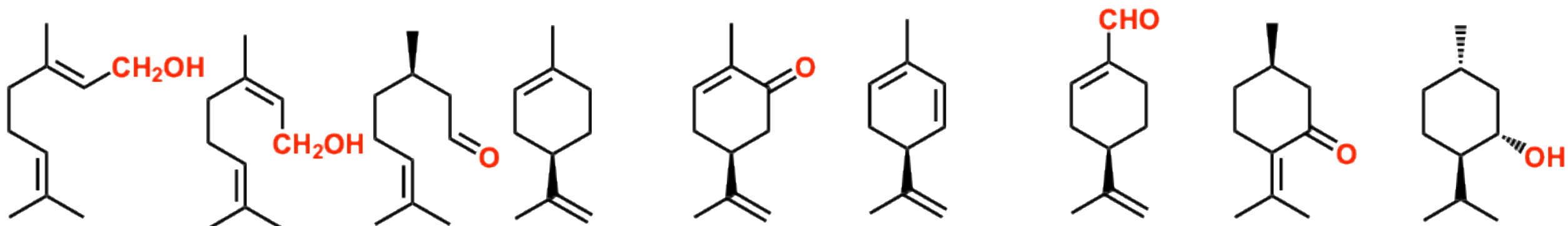
farnesyl-PP (C₁₅)



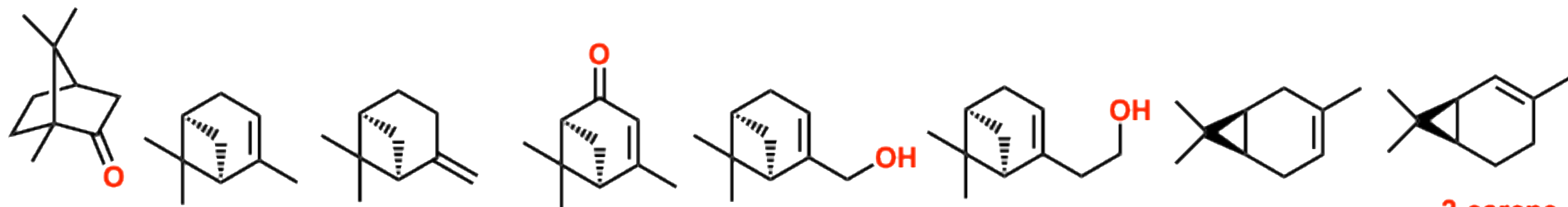
geranylgeraniol-PP (C₂₀)



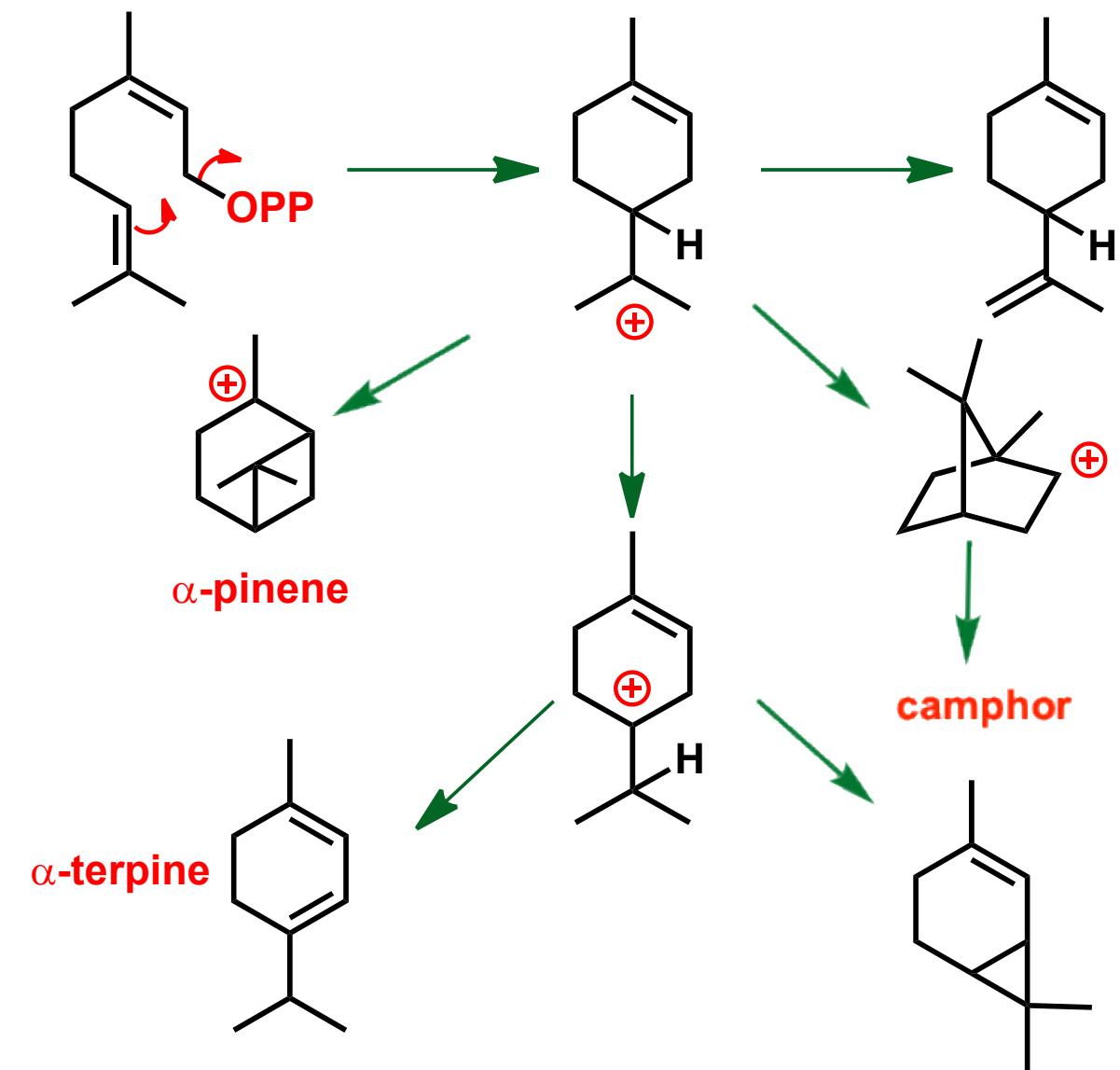
squalene (C₃₀)



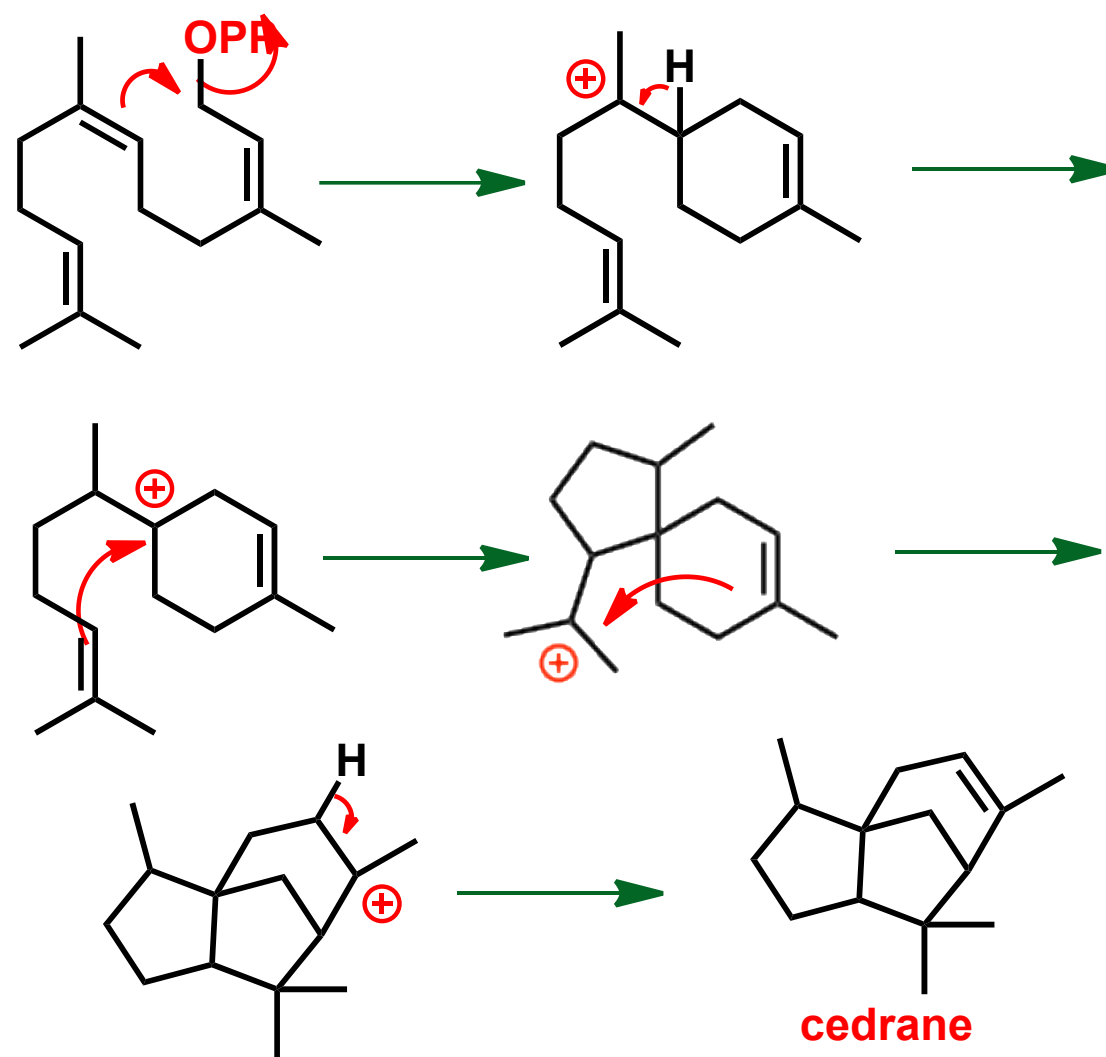
geraniol nerol citronellal R-limonene S-carvone phyllandrene perillaldehyde R-Pulegone menthol



camphor α -pinene β -pinene verbenone myrtenol nopol 3-carene 2-carene

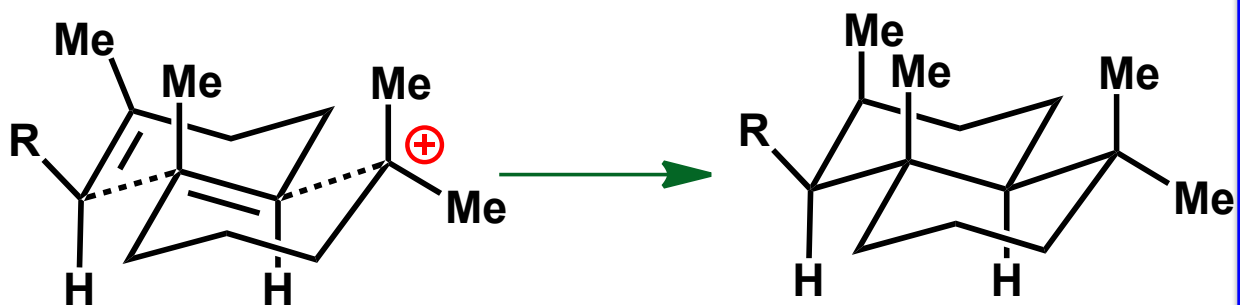


Biosynthesis of cedrane



Stork-Eschenmoser Hypothesis - olefin geometry is preserved in the cyclization reaction

trans olefin leads to *trans* fused ring junction



Diterpene Biosynthesis

